REMARKS

The application was filed with Claims 1-8. Claims 9-20 were previously presented by amendment, and Claims 1-8 were cancelled. In response to a restriction requirement, Claims 9-19 were elected. Claim 20 has been cancelled. In the pending Office Action, Claims 9-16 and 18-19 stand rejected under 35 USC §102 and Claim 17 stands rejected under 35 USC §103. These rejections are respectfully traversed. Withdrawal of the rejections and reconsideration of the claims is respectfully requested.

Rejection under 35 USC §102

Claims 9-16 and 18-19 stand rejected under 35 USC §102(b) as being anticipated by JP 56057542 (JP '542). This rejection is respectfully traversed. Please find attached a certified translation of the '542 reference, also identified as application number S54-133297.

It is well established that in order for a claim to be anticipated by a prior art reference, each and every element of the claim must be found in that reference. According to the English language abstract, JP '542 discloses a truck jointly using a winch for a steep slope, wherein the winch and traveling wheels are simultaneously turned when clutches are thrown in, and wherein the speed of the winding of the wire of the winch loaded on the truck and circumferential speed of the traveling wheels of the truck are tuned, and the winch and the traveling wheels are driven by means of the same prime mover. The relative difference of the speed of winding of the wire and the circumferential speed of the driving wheels is eliminated by means of a differential device, and both loads are equalized at all times. See also page 2, paragraph 2, of the translation. When only the wheels are driven separately, the differential gears are locked when a clutch is released, and only the wheels are driven. See also page 6, first full

paragraph, of the translation. When using only the winch under a stationary condition, the differential gears are locked when the clutch is released, and only the winch is driven. See also page 6, second full paragraph, of the translation.

JP '542 does not disclose the step of providing a central control system and a plurality of sensors for transmitting data to the central control system, as required by Claim 9, as amended. JP '542 further does not disclose the steps of said sensors detecting a speed of the driving chain, and of the cable. JP '542 further does not disclose the step of said central control system comparing the detected speed of the driving chain and the cable, nor the step of said central control system determining a desired value for the speed of the cable and controlling the cable winch to attain the desired value, all as required by Claim 9, as amended. Support for the amendment of Claim 9 can be found in paragraphs [0025]-[0027] of the specification, which disclose the control system of the invention.

JP '542 also clearly does not disclose the method including a step of detecting a pulling force in the cable and controlling the cable winch to maintain the pulling force below a specifiable highest value for the pulling force, as required by dependent Claim 14.

Further, JP '542 does not disclose the method wherein the speed of the cable is detected as a magnitude and a direction relative to a traveling direction of the snow-trail grooming vehicle.

Further, JP '542 clearly does not disclose the step of determining whether the driving chain of the snow-trail grooming vehicle is slipping, for determining the desired value for the speed of the cable

Because Claim 9 contains elements not found in JP '542, Claim 9 is not anticipated thereby. Withdrawal of the

rejection, and reconsideration of Claim 9, is therefore respectfully requested.

Claims 10-18 depend from Claim 9, are believed allowable therewith, and include additional features which further distinguish over the above reference.

Claim 19 requires a method for controlling a cable winch of a snow-trail grooming vehicle, comprising the steps of detecting a traveling speed of the snow-trail grooming vehicle over a ground surface according to direction and absolute value, detecting a speed of a cable wound on the cable winch according to direction and absolute value, comparing the detected traveling speed and the detected cable speed and determining a desired value for the cable speed for controlling the cable winch.

JP '542 does not disclose the steps of detecting of the traveling speed of the vehicle over a ground surface according to direction and absolute value, detecting a speed of a cable wound on the cable winch according to direction and absolute value, comparing the detected traveling speed and detected cable speed, and determining a desired value for the cable speed for controlling the cable winch, all of which are required by Claim 19. Because these elements are not found in JP '542, Claim 19 is not anticipated thereby. Withdrawal of the rejection, and reconsideration of Claim 19, is respectfully requested.

Rejection under 35 USC §103

Claim 17 stands rejected under 35 USC §103(a) as being unpatentable over JP '542 in view of U.S. Patent 6 585 232 to Rechenmacher et al.

In order to establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary

skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991)

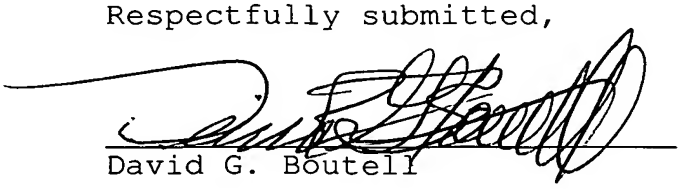
Claim 17 requires the method according to Claim 9, further comprising the step of determining an angle of slope between a traveling direction of the snow-trail grooming vehicle and the horizontal, and a direction of the speed of the cable relative to the traveling direction, for determining the desired value for the speed of the cable.

Neither JP '542 nor Rechenmacher et al. '232 disclose the step of determining an angle of slope between a traveling direction of the snow-trail grooming vehicle and the horizontal. Therefore, the combination of these references, even if tenable, does not teach or suggest all of the claim limitations. Accordingly, withdrawal of the rejection of Claim 17, and reconsideration, is respectfully requested.

Conclusion

In light of the foregoing, Claims 9-19 are believed to be in condition for allowance. Early Notice of Allowability is courteously solicited. If necessary to expedite prosecution of the application, the Examiner is invited to contact Applicant's representatives listed below.

Respectfully submitted,



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I, Charles Edward SITCH BA,

Acting Managing Director of RWS Group Ltd UK Translation Division, of Europa House, Marsham Way, Gerrards Cross, Buckinghamshire, England declare;

1. That I am a citizen of the United Kingdom of Great Britain and Northern Ireland.

2. That the translator responsible for the attached translation is well acquainted with the Japanese and English languages.

3. That the attached is, to the best of RWS Group Ltd knowledge and belief, a true translation into the English language of the accompanying copy of the specification filed with the application for a patent in Japan on October 16, 1979 under the number S54-133297 and the official certificate attached hereto.

4. That I believe that all statements made herein of my own knowledge are true and that all statements made on information and belief are true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the patent application in the United States of America or any patent issuing thereon.

For and on behalf of RWS Group Ltd

The 13th day of September 2006

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(54) Truck making conjoint use of a winch for steep slopes

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SPECIFICATION

1. Title of the Invention: Truck making conjoint use of a winch for steep slopes

2. Scope of the Patent Claims

Truck making conjoint use of a winch for steep slopes characterized in that it has a configuration in which a winch is mounted on a truck equipped with driving wheels, a synchronization device is provided for synchronizing the wire winding speed of said winch and the peripheral speed of the abovementioned driving wheels, and also the abovementioned driving wheels and winch are driven by means of the same prime mover.

3. Detailed Description of the Invention

The present invention relates to a truck making conjoint use of a winch for steep slopes in which a small-sized winch is mounted on a truck, and various uses are possible such as travel of the truck making conjoint use of the winch, independent travel of the truck and independent use of the winch which is fixed to the truck.

It is possible in the case of fields on a steep slope located on inclined planes on mountains or the like to use a vehicle on a track or the like to transport materials such as fertilizer to grassy areas because grass paths are provided substantially along the contours, but inside the grassy areas there only remain steeply inclined planes, and so it has proved very troublesome until now to convey items by human power without an appropriate conveying means.

Conventionally, there exist vehicles of the conjoint-use winch type as trucks (operating vehicles) which are used for mountains and forests, but the winding radius of the winch changes as the winch wire grows longer, and therefore it is not possible to synchronize the

peripheral speed of the wheels with the winding speed of the wire, and the slip of the wheels increases while the wire is subject to excessive tension. Consequently, there are problems in terms of the durability of the machine as a result of an increased danger of the wire breaking or the like, and there are problems in practical use.

In this regard the present invention provides a truck making conjoint use of a winch for steep slopes which is provided with a synchronization device for synchronizing the wire winding speed of a winch which is mounted on a truck equipped with driving wheels and the peripheral speed of the abovementioned driving wheels, and also the abovementioned driving wheels and winch are driven by means of the same prime mover; it is possible to achieve, among other things, travel of the truck making conjoint use of the winch, independent travel of the truck and independent use of the winch which is fixed to the truck; a wide range of uses are possible from level ground to steeply inclined planes, loads can be carried across steeply inclined grassy areas, and in particular the toil of conveying loads over steeply inclined fields can be lightened.

One exemplary embodiment of the present invention is specifically described below with reference to the figures.

In Figure 1, the symbol 1 denotes a vehicle body; this vehicle body 1 is provided with four-wheel drive or multi-wheel drive traveling wheels 2 which are capable of high-speed travel and an operating seat 3, and a small-sized winch 4 is mounted on the front side of the operating seat 3. Furthermore, an engine E, which is shown in Figure 2, is mounted on the vehicle body 1, and the output side of said engine E is joined to a differential gear D via a main clutch C and a

transmission M. The differential gear D comprises power transmission intermediate shafts IS on its left and right sides, and one of these extends out to the traveling device 2 side, while the other extends out to the winch 4 side.

A clutch C1 is provided on the intermediate shaft IS on the winch 4 side, and when said shaft is connected to said clutch C1, rotational force is produced as output A1 on the winch side, the winch drum WD is driven, and brakes BW are provided on the winch drum WD. Furthermore, a clutch C2 is also provided on the intermediate shaft IS on the side of the traveling wheels 2, and when said shaft is connected to said clutch C2, rotational force is produced as output A2 on the traveling wheels side, left and right drive wheels Pdl, Pdr are both driven via a propeller shaft PS and the differential gear Dd, and both drive wheels Pdl, Pdr are equipped with respective brakes Bd. Then, the clutches C1 and C2 which are provided on the abovementioned intermediate shafts IS move in response to the movement of the differential lock action of the differential gear D. That is to say, this is an on/off switching system in which the differential lock is actuated when the clutches C1, C2 are disconnected, and in which the differential lock of the differential gear D is released when the clutches C1, C2 are connected.

Moreover, in Figure 1, the symbol F denotes a field (grassy area) where the oblique surface of a steeply inclined plane is formed, FR denotes a grass path provided substantially along the contours inside the field F, and 5 denotes an anchor provided embedded in the region of the grass path FR.

The truck configured in this way is used for travel over steep slopes where the winch may be used conjointly, independent travel of the truck,

independent use of the winch which is fixed to the truck, and such like.

When the truck travels using the winch conjointly, for example in the oblique direction over the field F of the steeply inclined plane shown in Figure 1, the gravity G of the load W (fertilizer, for example) which is loaded on the load carrier of the truck tends toward the vector W direction of the line segment $W\sin\theta$ and $W\cos\theta$, with θ being the angle of incline of the field F, and there is a risk when ascending or descending that the load will lean toward one side of the vehicle body at the end, and cause it to tip over, and since independent travel of the truck is not possible, the tip end of the wire 4a is joined to the anchor 5, the winch drum WD and the traveling wheels 2 (the left and right drive wheels Pdl, Pdr) rotate at the same time when the clutches C1 and C2 are connected. Changing gear, moving off, stopping and braking are all performed in the usual way for a normal motor vehicle by means of the main clutch C, the transmission M and the brake Bd. This being so, a differential gear D is installed on the intermediate shafts IS which lead to the winch drum WD and the propeller shaft PS, and therefore the difference in the winding speed V1 of the wire 4a and the peripheral speed V2 of the drive wheels Pdl, Pdr with respect to each other is eliminated, and also it is possible to keep the load on both constantly even, preventing uneven concentrations of load. That is to say, the tensile strength Pw of the wire 4a attains almost the same value as the driving force (Pdl + Pdr) of the driving wheels, and accordingly the overall driving force P is

$$P = Pw + Pdl + Pdr$$

which is about twice that of the traveling wheels, and travel is possible even on steep slopes with difficult

conditions, like the field F. Accordingly, it is possible to prevent the truck from tipping over or from going out of control or the like and for the truck to move in a stable manner.

In the case where the truck is being used for independent travel using only the drive wheels, for example when traveling on a grass path FR, when the clutch C1 is disconnected, the differential gear D is differentially locked, and only the travel wheels 2 are driven with the winch 4 remaining stopped. Changing gear, moving off, stopping and braking are performed using the main clutch C, transmission M and brake Bd, in exactly the same way as for a normal motor vehicle. Accordingly, a truck such as that described above which is ascending or descending a field F is able to travel at high speed over grass paths FR with a load stacked on board.

In the case where the travel of the truck is stopped and only the winch 4 is being used in a fixed state, when the clutch C2 is disconnected the differential gear D is differentially locked, and only the winch 4 rotates with the traveling wheels 2 remaining stopped. The action of the winch 4 is operated using the main clutch C, transmission M and brake BW. Of course, means are also necessary for holding the vehicle body 1 fixed on the ground when a heavy load is being carried at the same time as the truck brakes Bd are applied.

The truck making conjoint use of a winch for steep slopes according to the present invention which has been described above is such that the wire winding speed of the winch mounted on the truck and the peripheral speed of the traveling wheels of the truck are synchronized, and the winch and the traveling wheels are driven by the same prime mover, and therefore loads can be transported safely (going up or

down) over steep slopes such as fields, furthermore various uses are possible by a simple operation, such as independent travel of the traveling wheels only over level ground and independent use of the winch with the truck stopped, and in addition it is possible to endow the truck with a compact configuration.

4. Brief Description of the Figures

Figure 1 is a side surface view of the truck presented in the exemplary embodiment of the present invention, and said truck in a state of use; and Figure 2 is a block diagram of the main mechanism of the truck.

1...vehicle body, 2...traveling wheels, 4...winch, 4a...wire, 5...anchor, F...field, FR...grass path, E...engine, C...main clutch, M...transmission, D...differential gear, C1, C2...clutch, WD...winch drum, Pdl...left drive wheel, Pdr...right drive wheel.

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